

Medical Science

25(117), November, 2021

To Cite:

Abozaid H, Alshanbari S, Alotaibi A, Faydh J, Althuwaybi S, Alsuwailem N, Alzahrani K. Measuring the knowledge and confidence of family medicine residents on doing minor surgical procedures in Taif, KSA. Medical Science, 2021, 25(117), 2953-2961

Author Affiliation:

¹Department of Family and Community Medicine, College of Medicine, Taif University, P.O Box 11099, Taif 21944, Saudi Arabia

²Medical Student, Taif University, Taif, Saudi Arabia

³Medical Student, Princess Noura Bint Abdulrahman University, Riyadh, Saudi Arabia

⁴Medical Student, Imam Abdulrahman bin Faisal University, Dammam, Saudi Arabia

⁵BDS, PGD Endo, Ministry of Health, Taif, Saudi Arabia

Corresponding author

Medical Student, Taif University, Taif, Saudi Arabia
Email: samahfa7@gmail.com

Peer-Review History

Received: 11 October 2021

Reviewed & Revised: 13/October/2021 to 08/November/2021

Accepted: 10 November 2021

Published: November 2021

Peer-review Method

External peer-review was done through double-blind method.

Measuring the knowledge and confidence of family medicine residents on doing minor surgical procedures in Taif, KSA

Hani Abozaid¹, Samah Alshanbari²✉, Amjad Alotaibi³, Jamal Faydh², Saad Althuwaybi², Norah Alsuwailem⁴, Khames Alzahrani⁵

ABSTRACT

Background: Family doctors are being sought for positions in remote regions where there is no easy access to specialty facilities or high-tech equipment. A family physician's everyday practice includes dealing with surgical issues. While certain treatments are routinely performed in the hospital, others, such as come downs surgical care, abscesses, ingrown toe nails, or minor wound management, are considered more difficult, and these people are usually sent to a surgeon. This study was conducted to assess the level of knowledge and confidence among family medicine residents in Taif, Saudi Arabia. **Methods:** This is a cross-sectional observational descriptive study that started in July 2020. The study's population includes Family medicine residents in Taif, Saudi Arabia, at all levels from R1 to R4. The instrument used was an electronic questionnaire in English. **Result:** This study included responses from 114 family medicines residents from the western province of Saudi Arabia. The assessment of practices related to different M.S.P.s (minor surgical procedures) showed that 'wound closure and dressings' was the most common procedure performed independently by residents. The most common barriers in performing M.S.P.s were lack of training (49.1%), lack of trainers (49.1%), and lack of facilities (25.4%). **Conclusion:** Most of the F.M. residents had basic knowledge and were interested in improving their practicing skills related to M.S.P.s but were not confident enough to do certain procedures. Constant preceptor supervision and critical analysis while performing M.S.P.s in primary care are essential for enhancing the surgical skills of medical graduates.

Keywords: electronic questionnaire, Medical competencies, surgical skills, Primary health care



DISCOVERY
SCIENTIFIC SOCIETY

© 2021 Discovery Scientific Society. This work is licensed under a Creative Commons Attribution 4.0 International License.

1. INTRODUCTION

Medical competencies are a large and important part of practicing family medicine. Family doctors should have the ability to master a range of clinical expertise and preparedness to Rural jobs with no convenient access to specialist facilities or high Technology (Mohamed et al., 2017). Surgical problems form a part of a family physician's daily routine. While some of the procedures are typically performed in the hospital, some are thought to be more complex, such as comedones surgical care, abscesses, ingrown toe nail, or minor wound management, and in most cases, these individuals are sent to a surgeon (Gmajnić et al., 2008).

Primary health care is a new concept which aims to provide a comprehensive basic health care system that meets people's basic needs. These requirements vary depending on the country and the environment, politics, economics, and culture. The implementation stage and delivery process of such robust programs vary accordingly (Al-Shammari and Khoja, 1996). Most rehearsing FM doctors, regardless of whether confirmed or in residency preparing, do not perform MSPs in the ordinary course of their day-by-day practice, or in the unlikely event that they do, just embrace a constrained rundown of MSP types. This might be ascribed to a few elements, including an absence of preparing, absence of setting, and absence of time (Andijany and AlAteeq, 2019). As a general rule, not many of these procedures are executed in the essential care offices in Saudi Arabia and numerous other nations around (Al-Ahaideb et al., 2012).

In K.S.A one study of (P.H.C.) doctors in AL-Qatif City investigated physicians' expectations, behaviors, and willingness to pursue M.S.P.s. Most (86.9 percent) were interested in performing MSPs in the setting of the PHCC; however, they were unsure. Recorded obstacles to conducting MSPs were insufficient facilities (90.2%), shortages of personnel (55.8%), dread of complications (73.7%), medical needs (72.2%), time constraints (70.4%), and ease of referral to other specialties (57.3%). Many physicians have reported lacking the training (80 percent) and experience (65.4 percent) required to perform MSPs (Alfaraj et al., 2015). From 69 procedures evaluated in a study in Canada to evaluate Residents' procedural knowledge and skills in Alberta's Canadian Family Medicine Programs in 2018, 15 (21.7%) had previously been performed by 50 percent or more residents at least five times. Just five procedures were classified and the ability to carry out independently or instruct others by 80 percent or a combination resident: quick Suture, local anaesthetic penetration, intramuscular injection, skin lesion cryotherapy, and Pap smear. Male residents were more confident in conducting 10 operations than female residents; where as female residents were more confident in administering Pap smears. Rural residents felt more comfortable compared to those in cities in performing 22 procedures (C, 2018).

In 2016, a study about FM Residents & knowledge, interest, experience, and confidence in performing various MSPs at the center of Kingdom of S.A. Residents had a 15.75 percent average information score and 10.4 out of a possible 12 average interest score. Residents had reached the mean average was 9.18 out of 23 MSPs surveyed. The average confidence scores for residents were Out of a possible 63 points, 26.6 are achieved. The most common impediment to completing MSPs was a lack of training (n=115; 59.9 percent), while the least prevalent barrier was a lack of interest (n=113; 58.9 percent) (Andijany and AlAteeq, 2019).

There are a few types of research related to our topic in western Saudi Arabia, and we need more studies to explore this issue. This cross-sectional observational study was conducted to assess the level of knowledge and confidence among family medicine residents in Taif, Saudi Arabia, about performing minor surgical procedures. Moreover, to explore what are the barriers and how to improve these skills.

2. SUBJECTS AND METHODS

Study design

This is a cross-sectional observational descriptive study conducted in Taif, which is located in the western part of the Kingdom of Saudi Arabia. The study's population include Family medicine resident in Taif, Saudi Arabia, at all levels from R1 to R4 Participants were recruited between July 2020-August 2021 from the FMR attending the centers of training in Taif. The inclusion criteria are Family medicine residents, male or female, in the program of Taif, Saudi Arabia, who agreed to participate. The exclusion criteria are any resident not in the family medicine residency program in Taif or family medicine resident in Taif.

Data collection

Data was gathered through a self-administered survey that was circulated via media platforms towards the Saudi population. The questionnaire consisted of two parts sections: the first section was for demographic data (gender, current training level, and current training centers). Moreover, the second section consisted of seven categories with a total of 71 questions. The seven categories included questions on knowledge of multiple MSPs (four questions), previously MSP training (four questions), ambition in conducting MSPs (three questions), experience with 21 MSPs throughout various clinical internships (21 questions), confidence in

performing those 21 MSPs (21 questions), and perceived barriers to performing MSPs and ways to improve basic surgical skills (11 questions).

Statistical analyses and sample size calculation

Regarding qualitative categories, data were expressed as frequencies (number of respondents) and valid percentages. All P values less than 0.05 were deemed statistically significant. All statistical computations were performed using IBM SPSS (Statistical Package for the Social Science; IBM Corp, Armonk, NY, USA), version 21 for Microsoft Windows. We considered a level of confidence of 95%, an error margin of 5%, and a response distribution of 50%. The questionnaire was completed by 114 eligible individuals, who were then statistically analysed.

Ethical considerations

At the beginning of the questionnaire, a statement was inserted to stress that the data obtained would be anonymous and used solely for research reasons. All participants were asked if they agreed or disagreed with taking part in the study. Only those who agreed to take part were considered. Before beginning any study-related operations, the Research Ethics Committee at Al-Hada Armed Forces Hospital provided ethical permission (ethical approval code: H-02-T-078).

3. RESULTS

Data was collected during the period from the July 2020-August 2021. This study included responses from 114 family medicines residents from the western province of Saudi Arabia. The sociodemographic analysis of the residents showed that 53.5% (n=61) were male and 46.5% (n=53) were females. The training levels of participating residents were as follows: R1 (36.8%), R2 (20.2%), R3 (11.4%), and R4 (31.6%). It was reported by 42% (n=49) of the residents that they received special training in minor surgical procedures (MSPs), and among these, 24.5% (n=12) had training for more than three days. The most common time they received training was during the internship (42.9%) (Table 1).

When we asked the residents about types of common surgical sutures, it was reported by 39.5% (n=45) that they knew them, and 7.9% did not know it. The knowledge regarding common types of suturing techniques was completely known to 30.7%, and 14.9% did not know it at all. The knowledge related to common types of suture knots showed that only 26.3% very well knew about them, and 20.2% did not know at all. It was reported by 39.5% that they could identify the common instruments used for minor surgeries (Table 2). It was observed that 98.2% (n=112) either strongly agreed or agreed in upgrading their proficiency in MSPs during residency. Similarly, the same percentage of residents (98.2%) supported the idea of taking courses/workshops in M.S.P.s during their educational holidays and 92.1% supported the idea of taking continuing education and practical sessions in minor surgical procedures in Half Day Released Course (HDRC).

Table 1 Socio-demographics characteristics of the study participants (n=114)

Socio-demographics characteristics		N	%
Gender	Male	61	53.5
	Female	53	46.5
Training level of residents	R1	42	36.8
	R2	23	20.2
	R3	13	11.4
	R4	36	31.6
Received special training in minor surgical procedures (n=114)	No	65	57.0
	Yes	49	43.0
Duration of the training in minor surgical procedures (n=49)	Few Hours	20	40.8
	1-3 days.	17	34.7
	> 3 days.	12	24.5
Time of training in minor surgical procedures (n=49)	During experience in emergency medicine as general practitioner	3	6.1
	During internship.	21	42.9

	During undergraduate training.	6	12.2
	During residency in Family medicine program.	18	36.7
	During Surgical residency program	1	2.0

Table 2 Knowledge related to minor surgical procedures

Knowledge related to minor surgical procedures			
	Yes	Partially known	No
I know the common types of surgical sutures	45 (39.5%)	60 (52.6%)	9 (7.9%)
I know the common types of suturing techniques	35 (30.7%)	62 (54.4%)	17(14.9%)
I know the common types of knots	30(26.3%)	61 (53.5%)	23 (20.2%)
I know the names of the common surgical instruments for minor surgical procedures	45(39.5%)	48 (42.1%)	21 (18.4%)

The assessment of practices related to different MSPs showed that 'wound closure and dressings' was the most common procedure that was performed independently by residents (45.6%) followed by Sutures removal (43.9%), Injection intramuscular or subcutaneous or intradermal (43.0%). When we assessed the MSPs that residents didn't perform at all, it was found that out of 23 procedures, skin biopsy and Excision of skin lesions (84.2%), (Figure 1). Intrauterine contraceptive device insertion and removal (84.2%), Thoracic tube insertion (83.3%) and corneal foreign body removal (82.5%) were some of the procedures. The mean total score for practices related to MSPs was found to be 12.34 ± 9.05 (Table 3). When we compared these mean total scores between the two genders, it was found that there was no statistically significant difference found between male (13.30 ± 10.14) and female residents (11.25 ± 7.55) ($p=0.229$). However, there were statistically significant differences observed in total means scores between resident's training levels where R2 (16.65 ± 9.81) and R3 (14.46 ± 5.61) showed higher scores compared to R1 (10.33 ± 9.60), which showed lesser scores ($p=0.033$) (Table 4).

The confidence levels of the residents to do 23 MSPs are summarized in (Table 3). The most common MSPs that residents were not confident at all were Thoracic tube insertion (42.1%), Lumbar puncture (39.5%), Aspiration and injections of joints, e.g., knee joints (36.8%), Intubation of airways (35.1%), and Skin biopsy and Excision of skin lesions (35.1%). Among the MSPs that residents found confident enough to do it alone and deal with the complications were Suture's removal (46.5%), followed by Injection intramuscular or subcutaneous or intradermal (35.1%) and Wound closure and dressings (34.2%) (Table 5). The scores for confidence levels were calculated (out of 69), and the mean total score for our study was found to be 28.8 ± 13.52 . The comparison of mean confidence scores in males (29.30 ± 13.50) and females (28.23 ± 13.67) did not show any statistically significant differences ($p=0.676$). Similarly, no statistically significant differences were observed in confidence scores between different training levels ($p=0.082$) (Table 6).

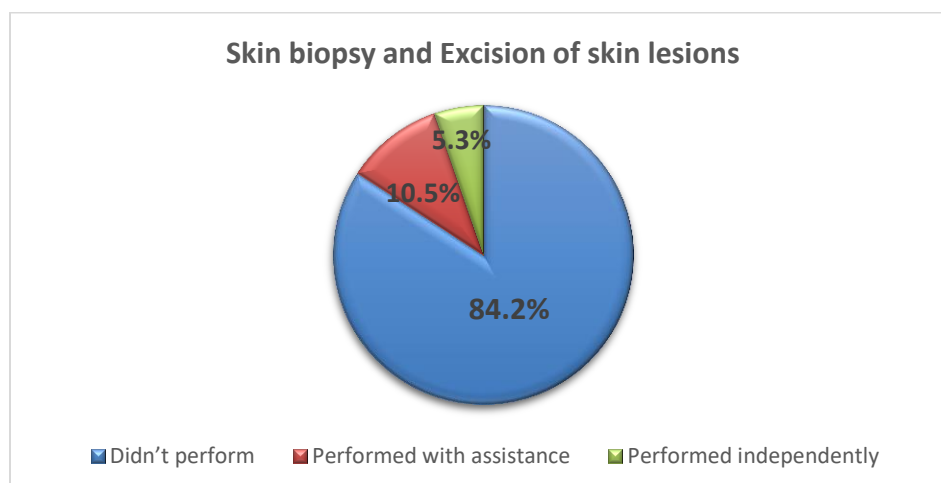
**Figure 1** Practices related to Skin biopsy and Excision of skin lesions procedures

Table 3 Practices related to minor surgical procedures

Practices related to minor surgical procedures				Mean total score (out of 46)
	Didn't perform (0)	Performed with assistance (1)	Performed independently (2)	
Injection intramuscular or subcutaneous or intradermal	40(35.1%)	25(21.9%)	49(43.0%)	12.34 (SD: 9.05)
Lumbar puncture	83 (72.8%)	23 (20.2%)	8 (7.0%)	
Nasogastric tube insertion and lavage	29 (25.4%)	49 (43.0%)	36 (31.6%)	
Foley's catheter insertion and removal	42 (36.8%)	27 (23.7%)	45 (39.5%)	
Intubation of airways	82 (71.9%)	20 (17.5%)	12 (10.5%)	
Thoracic tube insertion	95 (83.3%)	13 (11.4%)	6 (5.3%)	
Aspiration and injections of joints e.g. knee joints	92 (80.7%)	16 (14.0%)	6 (5.3%)	
Proctoscopy	91 (79.8%)	19 (16.7%)	4 (3.5%)	
Wound closure and dressings	19 (16.7%)	43 (37.7%)	52 (45.6%)	
Suture's removal	38 (33.3%)	26 (22.8%)	50 (43.9%)	
Casting removal	74 (64.9%)	25 (21.9%)	15 (13.2%)	
Ascetic taping	83 (72.8%)	19 (16.7%)	12 (10.5%)	
Incision and drainage of superficial abscesses	70 (61.4%)	24 (21.1%)	20 (17.5%)	
Excision of ingrowing nails	91 (79.8%)	18 (15.8%)	5 (4.4%)	
Ear wax aspiration	80 (70.2%)	21 (18.4%)	13 (11.4%)	
Nasal packing or cautery for control Epistaxis	85 (74.6%)	19 (16.7%)	10 (8.8%)	
Perform swabs (throat, eye, ear, wound, vaginal)	57 (50.0%)	24 (21.1%)	33 (28.9%)	
Demonstrate peak flow measurement and inhaler techniques	59 (51.8%)	25 (21.9%)	30 (26.3%)	
Cauterization and Cryosurgery (liquid nitrogen)	85 (74.6%)	15 (13.2%)	14 (12.3%)	
Skin biopsy and Excision of skin lesions	96 (84.2%)	12 (10.5%)	6 (5.3%)	
Corneal foreign body removal	94(82.5%)	7 (6.1%)	13 (11.4%)	
Obtaining vaginal and cervical cytology	91 (79.8%)	10 (8.8%)	13(11.4%)	
Intrauterine contraceptive device insertion and removal	96 (84.2%)	13 (11.4%)	5 (4.4%)	

Table 4 Comparison of practices (previous experience) based on gender and training level

Comparison of practices (previous experience) based on gender and training level					
		N	Mean	Std. Deviation	P value
Gender	Male	61	13.30	10.14	0.229
	Female	53	11.25	7.55	
	Total	114	28.80	13.53	
Training level	R1	42	10.33	9.60	0.033
	R2	23	16.65	9.81	
	R3	13	14.46	5.61	
	R4	36	11.17	8.07	
	Total	114	28.80	13.53	

When we assessed, the most common barriers in performing MSPs were lack of training (49.1%), lack of trainers (49.1%), and lack of facilities (25.4%). The least common barriers reported were lack of interest (61.4%) and lack of time (46.5%). When we asked the residents about the most effective way to combat these barriers, it was reported by 40.4% that 'making modifications in the curriculum to enhance these issues' was the most commonly reported on, followed by 'to intensify educational activity during residency training program (workshop, skill lab, and lectures)' (34.2%). The least effective way reported was 'Taking some clinics in surgery during rotation in Family medicine clinic' (41.2%).

We observed a statistically significant positive correlation of knowledge of the residents in MSPs with training received ($p<0.001$), duration of training three days ($p<0.001$), training during surgical residency program ($p=0.011$), previous MSP practices ($p<0.001$) and confidence level ($p=0.001$). There was also a statistically significant positive correlation observed for practices with training received ($p<0.001$), duration of training >three days ($p<0.001$), training during the internship ($p<0.001$), training during surgical residency program ($p=0.022$) and confidence levels ($p<0.001$). There was also a positive correlation observed for confidence levels with the duration of training three days ($p<0.027$) (Table 7).

Table 5 Confidence in performing MSPs

Confidence in performing MSPs	Confidence level*				Total Mean score (SD)
	0	1	2	3	
Injection intramuscular or subcutaneous or intradermal	13 (11.4%)	27 (23.7%)	34 (29.8%)	40 (35.1%)	28.80 (13.52)
Lumbar puncture	45 (39.5%)	50 (43.9%)	18 (15.8%)	1 (0.9%)	
Nasogastric tube insertion and lavage	17(14.9%)	35(30.7%)	33(28.9%)	29(25.4%)	
Foley's catheter insertion and removal	14(12.3%)	34(29.8%)	38(33.3%)	28(24.6%)	
Intubation of airways	40(35.1%)	50 (43.9%)	19(16.7%)	5 (4.4%)	
Thoracic tube insertion	48 (42.1%)	44(38.6%)	17 (14.9%)	5 (4.4%)	
Aspiration and injections of joints e.g., knee joints	42 (36.8%)	53 (46.5%)	17(14.9%)	2 (1.8%)	
Proctoscopy	41 (36.0%)	55(48.2%)	14(12.3%)	4(3.5%)	
Wound closure and dressings	9(7.9%)	29(25.4%)	37(32.5%)	39(34.2%)	
Suture's removal	11(9.6%)	20 (17.5%)	30(26.3%)	53 (46.5%)	
Casting removal	24 (21.1%)	40 (35.1%)	32 (28.1%)	18 (15.8%)	
Ascetic taping	40 (35.1%)	41 (36.0%)	23 (20.2%)	10 (8.8%)	
Incision and drainage of superficial abscesses	20 (17.5%)	42 (36.8%)	27 (23.7%)	25 (21.9%)	
Excision of ingrowing nails	34 (29.8%)	50 (43.9%)	22 (19.3%)	8 (7.0%)	
Ear wax aspiration	26 (22.8%)	50 (43.9%)	30 (26.3%)	8 (7.0%)	
Nasal packing or cautery for control Epistaxis	30(26.3%)	53 (46.5%)	23 (20.2%)	8 (7.0%)	
Perform swabs (throat, eye, ear, wound, vaginal)	19 (16.7%)	38 (33.3%)	20 (17.5%)	37 (32.5%)	
Demonstrate peak flow measurement and inhaler techniques	22 (19.3%)	35 (30.7%)	24 (21.1%)	33 (28.9%)	
Cauterization and Cryosurgery (liquid nitrogen)	35 (30.7%)	46 (40.4%)	20 (17.5%)	13 (11.4%)	
Skin biopsy and Excision of skin lesions	40 (35.1%)	45 (39.5%)	25 (21.9%)	4 (3.5%)	
Corneal foreign body removal	37 (32.5%)	44 (38.6%)	27 (23.7%)	6 (5.3%)	
Obtaining vaginal and cervical cytology	38 (33.3%)	46 (40.4%)	26 (22.8%)	4 (3.5%)	
Intrauterine contraceptive device insertion and removal	38(33.3%)	53(46.5%)	18(15.8%)	5(4.4%)	

* Confidence level scores:

0= not at all confident; 1= Confident to do it but with assistance; 2= Confident to do it alone but can't deal with the complications; 3=confident enough to do it alone and can deal with the complications.

Table 6 Comparison of confidence level based on gender and training level

		N	Mean	Std. Deviation	P value
Gender	Male	61	29.30	13.50	0.676
	Female	53	28.23	13.67	
	Total	114	28.80	13.53	
Training level	R1	42	28.79	14.70	0.082
	R2	23	34.70	13.98	
	R3	13	27.62	11.46	
	R4	36	25.47	11.62	
	Total	114	28.80	13.53	

Table 7 Bivariate correlation (p values for Spearman's correlation)

	Knowledge	Interest	Practices (Experience in MSPs)	Confidence
Gender	0.793	0.824	0.428	0.538
Training level	0.448	0.790	0.220	0.290
Received training	<0.001	0.542	<0.001*	0.964
Duration > 3 days	<0.001*	0.261	<0.001	0.027*
Duration <3 days	0.017	0.452	0.918	0.712
During experience in emergency medicine as general practitioner	0.757	0.514	0.654	0.851
During internship.	0.031*	0.470	0.012*	0.412
During undergraduate training.	0.542	0.782	0.450	0.768
During residency in Family medicine program.	0.719	0.186	0.115	0.076
During Surgical residency program	0.011*	0.112	0.022*	0.429
Knowledge		0.768	<0.001*	0.001*
Interest	0.768		0.115	0.314
Practices (Experience in MSPs)	<0.001*	0.115		<0.001*
Confidence	0.001*	0.314	<0.001*	

4. DISCUSSION

Skills in minor surgical procedures (MSPs) are an essential part of practice in Family medicine, and performing these procedures in outpatient primary care is more cost-effective and practical than sending patients to specialists. Our study found that only 43% of residents received training in MSPs, and out of this, approximately 43% received it during the internship. In order to be competent enough to perform MSPs, residents require adequate training during the internship or first year of a residency program or through continuing medical education (CME) (Hardavella et al., 2017; Pringle et al., 1991). Such training could include practical sessions, study days, or practice audits, which would help the residents enhance their skills in MSPs and recognize their limits (Berry and Harding, 1993; Humphreys et al., 2012). Unfortunately, there is no clear picture of what all MSPs students perform during their undergraduate surgical rotation and all surgical procedures they should be competent in upon graduating from medical school (Forbes et al., 2006). It has been suggested that surgical education goals in undergraduate training may not coincide with the needs of primary care physicians (Reznick et al., 1988). It has been observed that medical students spent very little time training in surgical procedures that are commonly performed in general practice (Spratt and Papp, 1997).

The current study findings showed that the majority of the residents didn't perform many MSPs such as Lumbar puncture, Intubation of airways, Thoracic tube insertion, Aspiration and injections of joints, e.g., knee joints, Proctoscopy, Ascetic taping,

Intrauterine contraceptive device insertion and removal, and skin biopsy and excision of skin lesions. This could be explained based on the fact that Family physicians do not routinely practice MSPs in KSA due to many reasons such as privilege or regulatory issues, lack of resources, or poor clinical settings. Also, these procedures are not commonly performed or trained during undergraduate clinical rotation (Andijany and Al Ateeq, 2019).

The confidence level of residents in our study to do many MSPs was unsatisfactory, and only a small percentage of them had acceptable confidence in performing such procedures. The knowledge and interest in surgery is an important factor that increases the confidence levels of medical students. Poor knowledge and interests in surgery would lead the graduates to select other non-surgical specialties that have a low requirement in MSPs. Many factors influence the choice of surgery, such as pre-clerkship exposures, mentorship, students interests, duration of the training, role modeling from trainers, gender bias, global health exposure, availability of sufficient resources in performing surgical procedures, financial rewards, etc. (Peel et al., 2018). Majority of the residents showed interests in upgrading their proficiency in surgical skills and supported the idea of attending courses/workshops in MSPs. Curriculum planners in Family medicine should consider these interests of residents and make necessary changes in the curriculum to help residents confidently perform MSPs without assistance. This is evident through our study, which showed that knowledge and enough experience in MSPs improved the confidence levels of residents in performing such procedures. This is supported by a study done in KSA by Alfaraj et al., (2015) which reported that physicians showed a very high interest in performing MSP (C, 2018). A positive correlation was observed in our study between knowledge related to M.S.P.s and residents who received training in such procedures. In another study done in Riyadh province, it was reported that physicians working in rural areas performed MSPs more than those in urban areas, and those who performed certain skills such as resuscitation, handling trauma and fractures, and venous cut-down showed higher confidence in performing such skills than those who didn't do such procedures (Alfaraj et al., 2015).

FM Residents were not confident in performing certain procedures that need more skills, and those require utmost attention, such as Lumbar puncture, Thoracic tube insertion, Aspiration, and injections of joints, e.g., knee joints and Proctoscopy. Another Canadian study reported that family physicians did not perform certain MSPs such as endometrial biopsy, excisions related to skin, shoulder injection, and knee injection (Sempowski et al., 2006). In our study, residents were more confident in performing certain MSPs such as Suture's removal, wound closure and dressings, Perform swabs, intramuscular or subcutaneous or intradermal injections. These procedures are easy and commonly performed in clinics and thus support the fact that sufficient exposure to certain procedures improves the confidence levels of the residents.

In primary care clinics, MSPs related to skin are the most commonly performed procedures. Evidence shows that resection of skin lesions (epidermoid carcinoma, melanoma, etc.) performed by general medical practitioners is similar to those by specialists (Delaney et al., 2012). The main barriers reported by our residents were lack of training, trainers and facilities. A study done in primary care physicians by Menahem et al. (2014), has reported similar findings where lack of time and training were the main barriers for performing MSPs. Medical education is undergoing tremendous transition, and traditional teaching, where the tutor is the only transmitter of knowledge, is no longer compatible with health care needs. New learning and teaching strategies need to be implemented to make medical graduates competent enough in surgical skills in performing MSPs. Many teaching methods have shown effectiveness in improving practical skills in surgery for undergraduate students (Ong et al., 2020).

Our study poses some limitations, and these should be addressed before generalizing our study findings. First, the data we collected was self-reported by the residents themselves, which could have led to recall bias and social desirability bias. Secondly, residents interested in the subject could have only answered the questionnaire and tend to perform some procedures more than others who didn't, which could have led to response bias. Thirdly, the study was limited to the Western province of KSA, and the findings may not be generalizable to all FM residents in KSA. However, the findings of our study are similar to those from other provinces and countries, which strengthen the reliability of the results of our region.

5. CONCLUSION

Most of the FM residents had basic knowledge and were interested in improving their practicing skills related to MSPs but were not confident enough to do certain procedures. Constant preceptor supervision and critical analysis while performing MSPs in primary care are essential for enhancing the surgical skills of medical graduates. HMOs and individuals responsible for training medical graduates should encourage primary care physicians and FM residents to perform MSPs by conducting workshops, CME programs with practical hands-on experiences on real patients. Furthermore, these procedures should be included in the FM residency program framework as well as in other postgraduate CME programs in primary care.

Ethics approval

Institutional research ethics board approval was acquired before conducting any study-related procedures. In addition, a statement was included at the beginning of the questionnaire clarifying that participation in this study is voluntary and that collected data will be anonymous and will only be used for this study. Ethical approval was obtained from Research Ethics Committee at Al-Hada Armed Forces hospital (ethical approval code: H-02-T-078).

Acknowledgements

Taif University Researchers Supporting Project number (TURSP-2020/234), Taif University, Taif, Saudi Arabia.

Abbreviations

MSP: Minor Surgical Procedures; PHC: Primary health care.

Funding

This study has not received any external funding.

Conflict of Interest

The authors declare that there are no conflicts of interests.

Data and materials availability

All data associated with this study are presented in the paper.

REFERENCES AND NOTES

1. Al-Ahaideb A, Khoshhal K, Alsiddiky A. Patterns and Obstacles of Provision of Minor Orthopedic Procedures among Primary Care Physicians in Saudi Arabia. *Int J Health Sci (Qassim)* 2012; 6(1):13-21.
2. Alfaraaj AW, Alharbi W, Sebiany A. Primary healthcare physicians' attitude and perceived barriers regarding minor surgeries. *J Heal Spec* 2015; 3(2):67.
3. Al-Shammari S, Khoja T. Minor surgery at primary care centers in Riyadh, Saudi Arabia. *Ann Saudi Med* 1996; 16(5):534-538.
4. Andijany MA, AlAteeq MA. Family medicine residents in central Saudi Arabia. How much do they know and how confident are they in performing minor surgical procedures? *Saudi Med J* 2019; 40(2):168-176.
5. Berry DP, Harding KG. Potential pitfalls of minor surgery in general practice. *Br J Gen Pract* 1993; 43(374):358-359.
6. Forbes SS, Fitzgerald PG, Birch DW. Undergraduate surgical training: Variations in program objectives and curriculum implementation across Canada. *Can J Surg* 2006; 49(1):46-50.
7. Gmajnić R, Pribić S, Lukić A, Ebling B, Čupić N, Marković I. Effect of surgical training course on performance of minor surgical procedures in family medicine physicians' offices: An observational study. *Croat Med J* 2008; 49(3):358-363.
8. Hardavella G, Aamli-Gagnat A, Frille A, Saad N, Niculescu A, Powell P. Top tips to deal with challenging situations: doctor-patient interactions. *Breathe (Sheffield, England)* 2017; 13(2):129-135.
9. Humphreys H, Coia JE, Stacey A, et al. Guidelines on the facilities required for minor surgical procedures and minimal access interventions. *J Hosp Infect* 2012; 80(2):103-109.
10. Mohamed KG, Hunskaar S, Abdelrahman SH, Malik EM. Confidence in Procedural Skills before and after a Two-Year Master's Programme in Family Medicine in Gezira State, Sudan. *Adv Med* 2017; 2017:1-11.
11. Peel JK, Schlachta CM, Alkhamesi NA. A systematic review of the factors affecting choice of surgery as a Procedural knowledge and skills of residents entering canadian family medicine programs in Alberta. *Fam Med* 2018; 50(1):10-21.
12. Pringle M, Hasler J, De Marco P. Training for minor surgery in general practice during preregistration surgical posts. *Br Med J* 1991; 302(6780):830-832.
13. Reznick RK, Brewer ML, Wesley RM, Spencer DL, Roland Folse J. The practicing doctor's perspective on the surgical curriculum. *Am J Surg* 1988; 156(1):38-42.
14. Spratt JS, Papp KK. Practicing primary care physicians' perspectives on the junior surgical clerkship. *Am J Surg* 1997; 173(3):231-233.